The Marshall Star

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Manager of Public and Employee Communications: June E. Malone
Editor: Jenalane Rowe

New 'Brain' for RS-25 Engine is No Technological Flashback to the '80s

By Megan Davidson

Take a look at your current devices. Can you imagine swapping that smartphone for a gigantic cellphone from the 1980s? Surfing the Internet with dial-up speed? Working out to your favorite music with a cassette player?

Today's technology is better, faster and more innovative. People have to keep up with the rapidly changing times, and so does the "brain" for the RS-25 rocket engine.

The engine controller unit on the RS-25 -- formerly known as the space shuttle main engine -- helped propel all of the space shuttle missions to space. It allows communication between the vehicle and the engine, relaying commands to the engine and transmitting data back to the vehicle. The controller also provides closed-loop

*See **RS-25 Engine** on page 2*

Bonnie Holmes, von Braun's Long-time Executive Assistant, Dies

By Michael Wright

Wernher von Braun once called her "the lady I work for." Von Braun, the first director of NASA's Marshall Space Flight Center, was humorously referring to his devoted long-time executive assistant Bonnie Holmes who recently passed away in nearby Eva on Dec. 5.

For Holmes and von Braun, it was an 18-year-long working relationship that began in 1952 on Redstone Arsenal and ended in 1970 when von Braun moved

*See **Holmes** on page 3*

Former Marshall Center Director William Lucas shakes hands with executive assistant Bonnie Holmes at her retirement party in 1978. (NASA/MSFC)

RS-25 Engine *Continued from page 1*

management of the engine by regulating the thrust and fuel mixture ratio while monitoring the engine's health and status.

Just like the ever-evolving computer, the engine controller unit needed a "refresh" to provide the capability necessary for four RS-25 engines to power the core stage of NASA's new rocket, the Space Launch System, to deep space missions. The core stage, towering more than 200 feet tall with a diameter of 27.6 feet, will store cryogenic liquid hydrogen and liquid oxygen that will feed the vehicle's RS-25 engines.

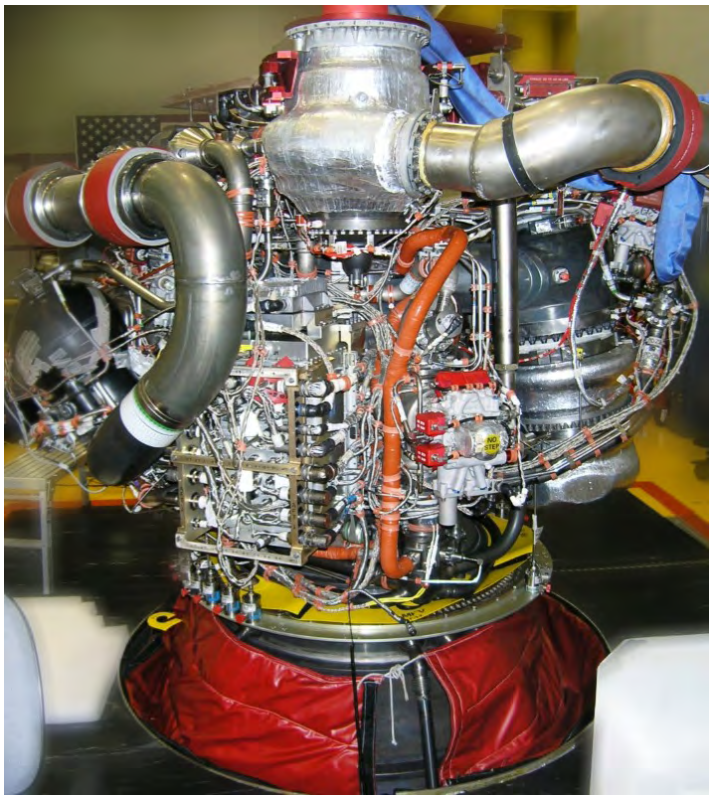
"You can't put yesterday's hardware on today's engine, especially since many parts of the shuttle-era engine controller unit aren't even made anymore," said Russ Abrams, avionics subsystem manager in the SLS Liquid Engines Office at NASA's Marshall Space Flight Center. Marshall manages the SLS Program for the agency. "We need the most updated control systems for this engine to meet SLS specifications and take us to places we've never been before in space."

Controller development is based heavily on the recent development experience with the J-2X engine controller. An engineering model RS-25 controller is being tweaked and tested at Marshall. At one of the center's test facilities, engineers are simulating the RS-25 in flight, using real engine actuators, sensors, connectors and harnesses.

A second engineering model controller and RS-25 engine also recently were installed on the A-1 test stand at NASA's Stennis Space Center. Pending final preparation and activation work, the engine test series is anticipated to begin in 2015.

"NASA and its partners have been working very hard to evolve this crucial piece of hardware and software for the RS-25, and we look forward to seeing it tested on the A-1 stand very soon," said Johnny Heflin, deputy manager of the SLS Liquid Engines Office at Marshall. "This is an exciting time for everyone involved with this project."

The RS-25 and controller work are a collaborative effort between NASA and prime contractor Aerojet Rocketdyne of Sacramento, California.



The engine controller unit allows communication between the vehicle and the engine, relaying commands to the engine and transmitting data back to the vehicle. Engineering model controllers are being tested at the Marshall Center and Stennis Space Center. (NASA/MSFC)

The first flight test of the SLS will be configured for a 70-metric-ton (77-ton) lift capacity and carry an uncrewed Orion spacecraft beyond low-Earth orbit to test the performance of the integrated system. As the SLS evolves, it will be the most powerful rocket ever built and provide an unprecedented lift capability of 130 metric tons (143 tons) to enable missions even farther into our solar system.

Davidson, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Marshall Center Hosts Mentor-Protégé Agreement Signing Between Jacobs, Linc Research

By Rick Smith and Christopher Blair

On Dec. 11, executives from the technology firms of Jacobs and Linc Research Inc., both in Huntsville, Alabama, signed a NASA Mentor-Protégé Agreement at NASA's Marshall Space Flight Center.

The 12-month agreement will support the Engineering and Science Systems and Skills Augmentation contract at the Marshall Center. This Mentor-Protégé Agreement is the second of its kind overseen by the Marshall Center, partnering a NASA prime contractor and a certified Historically Underutilized Business Zone small business. The federal "HUBZone" program is designed to promote job growth, capital investment and economic development for small businesses in economically challenged communities.

"Today's agreement builds upon Jacob's historical success with NASA by starting a new subcontracting future by working with Linc Research," said David Brock, small business specialist at Marshall. "This

*See **Mentor-Protègè Agreement** on page 4*

On Dec. 11, executives from the technology firms of Jacobs and Linc Research Inc., both in Huntsville, signed a NASA Mentor-Protégé Agreement at Marshall Center. Seated from left are Randy Lycans, vice president and general manager of Jacobs; Dawn Turner, contracting officer for the ESSSA contract; and Curtis Taylor, president of Linc Research. Standing from left are Delene Sedillo, acting deputy director for Marshall's Office of Procurement; Joann Belt, Jacobs ESSSA systems management skill lead; David Brock, small business specialist at Marshall; Ron Belz, ESSA small business liaison officer at Marshall; Chris Singer, director of Marshall's Engineering Directorate; Joe Eversole, contracting officer and chief in Marshall's Engineering Programs and Systems Support Office; Alicia Carroll, AST, technical resources management; Kierra Spann, contract specialist at Marshall; and T.K. Pendergrass, ESSSA contracting officer representative for Marshall. (NASA/MSFC/Emmett Given)

Holmes *Continued from page 1*

to NASA Headquarters. This was not long after von Braun and his team at Marshall developed the Saturn V rocket that landed the first humans on the moon in 1969. Their relationship was based on trust from beginning to end.

One day in 1952, von Braun, then working for the U.S. Army as leader of the pioneering rocket team, rushed to the hospital to see his new daughter born. It was the same day he was supposed to interview the person he might select to permanently work as his new executive assistant. So, Holmes was waiting just outside his door as he left.

That meant someone else had to select the new person. Although Holmes never got her interview with von Braun, she got the job and continued in the position when Von Braun and his team transferred to the newly formed Marshall Space Flight Center. In a 2013 interview, Holmes remembered the dedication ceremony of the Marshall Center in 1960: "I got to escort President Dwight Eisenhower to the stage where he officially named the George C. Marshall Space Flight Center."

As von Braun prepared to leave Huntsville for NASA Headquarters in 1970, Holmes was invited to assume her same job for von Braun at NASA Headquarters. However, she chose to decline the opportunity because of close ties to her family and friends in Eva and. Still von Braun convinced her to at least travel to Washington and interview her potential successors.

By the time Holmes retired in 1978, she had served as an executive assistant for four Marshall Center directors: von Braun, Eberhard Rees, Rocco Petrone and William Lucas.

After leaving NASA, she worked at the U.S. Space & Rocket Center and after her retirement from there, she became active in civic duties in Eva. She served a term as Eva town clerk and helped find funding for a park, library and senior center where she also worked for years as volunteer head librarian.

Wright is the Marshall Center historian.

Expedition 40 Astronaut Reid Wiseman Marks Successful Science Mission with Plaque Hanging at Marshall

Ryan Miller, right, lead payload planning manager for Expedition 39/40 with the Payload Operations Integration Center at the Marshall Space Flight Center, helps NASA astronaut Reid Wiseman prepare to autograph the International Space Station Expedition 40 mission plaque hanging in the POIC. Wiseman visited the Marshall Center Dec. 11 for a meeting with the Marshall-based payload operations team he worked with during his six months on the orbiting laboratory, discussing the finer points of the investigations performed on the space station from June through November 2014. (NASA/MSFC/ Emmett Given)

Mentor-Protègè Agreement *Continued from page 3*

commitment is much-needed and will benefit the north Alabama community."

Speakers at the signing event included Chris Singer, director of the Marshall Center's Engineering Directorate; Randy Lycans, vice president and general manager of Jacobs; Curtis Taylor, president of Linc Research; David Brock, small business specialist in Marshall's Office of Procurement; and T.K. Pendergrass, a Marshall contracting office representative.

"We're excited to contribute to another NASA contract and look forward to working with and learning from Jacobs," said Curtis Taylor, president of Linc Research, Inc. "Today's agreement will focus on and improve opportunities for the area's workforce."

The NASA Mentor-Protégé Program, established in 2008 by NASA's Office of Small Business Programs, allows NASA prime contractors opportunities to enter into mentor-protégé agreements with small businesses and historically black colleges and universities/minority-serving institutions under their subcontracting programs to establish long-term relationships, enhance technical capabilities and enable protégé companies to successfully compete for larger, more complex prime contract and subcontract awards. The Marshall Center oversaw NASA's first Mentor-Protégé signing agreement in February 2008.

"We have had more than 25 years of successful NASA support and are eager to share our knowledge," said Randy Lycans, vice president and general manager of Jacobs. "This allows us to continue our history of meeting NASA goals on-time and on-budget."

To learn more about NASA's Office of Small Business, visit here.

Follow NASA's Office of Small Business on Facebook and Twitter.

View the Marshall Mentor Protégé Agreement Media Advisory here.

Smith and Blair, ASRC Federal/Analytical Services employees, support the Office of Strategic Analysis & Communications.

Marshall Star to Take Break for Holiday Season; Resumes Jan. 7 with Special 2014 Year-in-Review Issue

This will be the last issue of the Marshall Star for 2014. The Star, published 50 times each year, will not publish for two weeks during the holiday season.

Publication will resume Jan. 7, with the special year-in-review issue, highlighting the 2014 accomplishments of NASA's Marshall Space Flight Center, its programs and projects, and its people. Visit the Marshall Star website on Jan. 7 at 2 p.m. for the new edition.

Orion Spacecraft Lands, New Horizons Spacecraft Gets 'Wake up' Call

The successful landing of NASA's new Orion spacecraft, and the final "wake-up" call for NASA's New Horizons spacecraft -- were both featured in the latest edition of "This Week @NASA," a weekly video program broadcast nationwide on NASA-TV and posted online.

On Dec. 5, Orion completed Exploration Flight Test-1 -- a two-orbit, 4.5-hour trip into space designed to test many of Orion's systems critical to crew safety – with splash down and recovery by a team of NASA, U.S. Navy and Lockheed Martin personnel aboard the USS Anchorage.

Orion traveled farther than any spacecraft designed for astronauts has been in more than 40 years. The capsule enables testing of the capabilities and technologies needed for future human missions to Mars, to be launched on the Space Launch System.

Also featured was NASA's New Horizons spacecraft -- which after traveling nine years toward the dwarf planet Pluto -- received its final wake-up call on Dec. 6. Ground controllers on Earth sent commands for the spacecraft to come out of hibernation and into active mode in order to prepare for a Pluto system flyby in July 2015.

Launched in 2006 on top of an Atlas V rocket at the Cape Canaveral Air Force Station, New Horizons has traveled three billion miles, with two-thirds of that time spent in hibernation to conserve battery power and fuel.

The spacecraft has a seven-instrument science payload that includes advanced imaging infrared and ultraviolet spectrometers, along with various multicolor and high-resolution cameras. The flyby mission will be the farthest any space mission has ever traveled to reach its primary target. It is schedule for its closest trajectory on July 14, 2015.

New Horizons is part of the New Frontiers Program, managed by NASA's Marshall Space Flight Center, seeking to conduct frequent, medium-class spacecraft missions to explore our solar system.

This and previous episodes can be viewed at www.youtube.com/user/NASAtelevision.

Obituaries

Jyles L. Machen, 78, of New Hope, Alabama, died Nov. 16. He retired from the Marshall Center in 1998 as a legislative affairs officer.

James Elwyn Johnston, 77, of Huntsville, died Nov. 20. He retired from the Marshall Center in 2005 as a structural materials specialist. He is survived by his wife, Mary Stagg Johnston.

Hilliard Mullins, 87, of Fayetteville, Tennessee, died Nov. 20. He retired from the Marshall Center in 1983 as an aerospace engineer. He is survived by his wife, Ada Cathleen Mullins.

Alton Hickerson, 86, of Elora, Tennessee, died Nov. 23. He retired from the Marshall Center in 1970 as an engineer.

John B. Townsend, 94, of Huntsville, died Nov. 25. He retired from the Marshall Center in 1979 as an equipment operations engineer.

Audie Edwin Anderson, 91, of Prentiss County, Mississippi, died Nov. 27. He retired from the Marshall Center in 1988 as a data analyst.

Bonnie Lou Green Holmes, 84, of Huntsville, died Dec. 5. She retired from the Marshall Center in 1978 as an executive assistant.

Eugene Henry Cagle, 88, of Rogersville, Alabama, died Dec. 8. He retired from the Marshall Center in 1981 as a test lab director. He is survived by his wife, Joyce Ann Fuqua Cagle.